

WHAT IS CLAIMED IS:

*Sub B*  
1. A method for machining a ceramic green sheet for forming a plurality of feedthrough holes on the ceramic green sheet, comprising the steps of:

allowing a laser beam emitted from a laser source to pass through a diffraction grating to split the beam into plural laser beams; and

simultaneously forming a plurality of feedthrough holes within a desired area on the ceramic green sheet by irradiating the laser beams split into plural beams onto the ceramic green sheet.

2. A method for machining a ceramic green sheet according to Claim 1, wherein the ceramic green sheet is irradiated with the laser beams while allowing the ceramic green sheet to travel.

3. A method for machining a ceramic green sheet according to Claim 1, wherein the ceramic green sheet is irradiated with the laser beams while allowing the ceramic green sheet to intermittently travel.

4. A method for machining a ceramic green sheet according to Claim 1, wherein the laser beam emitted from the laser source is a pulse laser beam.

5. A method for machining a ceramic green sheet for forming a plurality of feedthrough holes on the ceramic green sheet, comprising the steps of:

disposing a laser source for emitting a pulse laser beam, a diffraction grating for splitting the laser beam into plural laser beams, a galvano-scan mirror for allowing the laser beam to reflect with a predetermined reflection angle, a converging lens for individually converging the laser beams reflected from the galvano-scan mirror, and the ceramic green sheet so as to be arranged in a predetermined position;

allowing the laser beam emitted from the laser source to pass through the diffraction grating;

splitting the beam into plural laser beams;

irradiating the split pulse laser beams on the ceramic green sheet by allowing the beams to reflect with a galvano-scan mirror to simultaneously form a plurality of feedthrough holes within a desired area on the ceramic green sheet; and

repeatedly irradiating the ceramic green sheet with the laser beam by changing reflection angles of the galvano-scan mirror to form a plurality of feedthrough holes within a different area on the ceramic green sheet.

6. A method for machining a ceramic green sheet for forming a plurality of feedthrough holes on a ceramic green sheet,

comprising the steps of:

disposing a laser source for emitting a pulse laser beam, a galvano-scan mirror for allowing the laser beam to reflect at a predetermined angle, a diffraction grating for splitting the laser beam into plural laser beams, a converging lens for individually converging the laser beams split into plural beams, and the ceramic green sheet so as to be arranged in a predetermined position;

allowing the pulse laser beam emitted from the laser source;

reflecting the beam with the galvano-scan mirror;

allowing the laser beam reflected by the galvano-scan mirror to pass through the diffraction grating to split the beam into plural laser beams;

simultaneously forming a plurality of feedthrough holes within a desired area on the ceramic green sheet by irradiating the ceramic green sheet with the split pulse laser beams; and

repeatedly irradiating the ceramic green sheet with the laser beams by changing the reflection angle of the galvano-scan mirror to form a plurality of the feedthrough holes within a different area on the green sheet.

7. A method for machining a ceramic green sheet according to Claim 5, wherein the pulse laser beam is irradiated while allowing the ceramic green sheet to travel.

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8. A method for machining a ceramic green sheet according to Claim 1, wherein the diffraction grating is formed using a material having a high transmittance against the laser beam.

9. A method for machining a ceramic green sheet according to Claim 1, wherein the laser emitted from the laser source is a CO<sub>2</sub> laser.

*Sub C<sup>3</sup>*  
10. A method for machining a ceramic green sheet according to Claim 1, wherein the ceramic green sheet is provided with a carrier film for supporting one face of the ceramic green sheet.

*Sub A<sup>2</sup>*  
11. An apparatus for machining a ceramic green sheet comprising:

a support member for supporting the ceramic green sheet;  
a travel member for allowing the ceramic green sheet to travel along a predetermined direction;

a laser source;  
a diffraction grating for allowing the laser beam emitted from the laser source to pass through to split the beam into plural laser beams; and

a converging lens for individually converging the laser beams split into plural beams after passing through the diffraction grating to irradiate the laser beams onto the ceramic

green sheet supported with the support member.

12. An apparatus for machining a ceramic green sheet comprising:

a support member for supporting the ceramic green sheet;

a laser source;

a diffraction grating for allowing the laser beam emitted from the laser source to pass through to split the beam into plural laser beams;

a galvano-scan mirror for reflecting with a predetermined reflection angle each laser beam after passing through the diffraction grating and being split into plural beams;

a galvano-mirror driving member for changing the reflection angle of the galvano-scan mirror; and

a converging lens for individually converging the laser beams after being reflected with the galvano-scan mirror at a predetermined angle to irradiate each laser beam onto the ceramic green sheet supported with the support member.

13. An apparatus for machining a ceramic green sheet comprising:

a support member for supporting the ceramic green sheet;

a laser source;

a galvano-scan mirror for allowing the laser beam to reflect at a predetermined angle;

a galvano-scan mirror deriving member for changing the reflection angle of the galvano-scan mirror;

a diffraction grating for allowing the laser beam reflected by the galvano-scan mirror at a predetermined angle to pass through to split the beam into plural laser beams; and

a converging lens for individually converging the laser beam split into plural beams after passing through the diffraction grating to irradiate each laser beam onto the ceramic green sheet supported with the support member.

14. An apparatus for machining a ceramic green sheet according to Claim 12 comprising: a travel member for allowing the ceramic green sheet to travel along a predetermined direction.

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15. A method for machining a ceramic green sheet for forming a plurality of feedthrough holes having the same shape and size on the ceramic green sheet comprising the steps of:

allowing a laser beam emitted from a laser source to pass through a diffraction grating to split the beam into plural laser beams having a uniform shape and size corresponding to the shape and size of feedthrough holes to be formed; and

simultaneously forming a plurality of feedthrough holes having a uniform shape and size onto the ceramic green sheet by irradiating the laser beams uniformly split into plural beams

onto the ceramic green sheet.

16. A method for machining a ceramic green sheet comprising:

allowing a laser beam emitted from a laser source to pass through a diffraction grating to split the beam into plural laser beams having an energy suitable for forming fine holes with a hole diameter of 50  $\mu\text{m}$  or less on the ceramic green sheet; and

forming a plurality of fine holes with a diameter of 50  $\mu\text{m}$  or less by irradiating the laser beams split into plural beams onto the ceramic green sheet.

17. A method for machining a ceramic green sheet for forming a plurality of feedthrough holes on the ceramic green sheet one face of which is supported with a carrier film, comprising:

allowing a pulse laser beam emitted from a laser source to pass through a diffraction grating to split the beam into plural laser beams having such an energy that allows each split laser beam to penetrate through the ceramic green sheet but not to penetrate through the carrier film; and

forming a plurality of feedthrough holes on the ceramic green sheet by irradiating the pulse laser beams split into plural beams on one face of the ceramic green sheet that is not supported with the carrier film.

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*Editor*